

Remarks

The above Amendments and these Remarks are in reply to the Office Action mailed November 13, 2007.

I. Summary of Examiner's Objections and Rejections

Prior to the Office Action mailed November 13, 2007, Claims 1-13 were pending in the Application. In the Office Action, Figures 15, 16 and 17 were objected to as having been damaged in transmission. Claim 11 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 4-9 were rejected under 35 U.S.C. § 102(e) as being anticipated by Averbuch et al (US 7,085,401) (hereinafter "Averbuch"). Claims 2-3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Averbuch, and further in view of Divakaran et al (US 6,697,523) (hereinafter "Divakaran"). Claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Averbuch, and further in view of Sekiguchi et al (US 5,553,207) (hereinafter "Sekiguchi"). Claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Averbuch in view of Sekiguchi, and further in view of Watanabe et al (US 6,999,069) (hereinafter "Watanabe"). Claims 12-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Averbuch in view of Sekiguchi, and further in view of Simanovsky et al (US 6,026,143) (hereinafter "Simanovsky").

II. Summary of Applicant's Amendments

The present Reply cancels Claims 2 and 10; amends Claims 1, 3-5, 7, 9, 11-13; adds Claims 14-19; all as shown above. Applicant respectfully reserves the right to prosecute any originally presented or canceled claims in a continuing or future application.

III. Objections to Figures 15-17.

In the Office Action, Figures 15, 16 and 17 were objected to as having been damaged in transmission.

Replacement sheets for Figs. 15-17 have been resubmitted with this Reply.

IV. Claim Rejection under 35 U.S.C. § 112, second paragraph

Claim 11 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 has been amended as set forth above and reconsideration is respectfully requested.

V. Claim Rejections under 35 U.S.C. §102(e) and 35 U.S.C. § 103(a)

Claims 1 and 4-9 were rejected under 35 U.S.C. § 102(e) as being anticipated by Averbuch. Claims 2-3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Averbuch in view of Divakaran. Claim 2 has been cancelled. Claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Averbuch in view of Sekiguchi. Claim 10 has been cancelled. Claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Averbuch in view of Sekiguchi and Watanabe. Claims 12-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Averbuch in view of Sekiguchi and Simanovsky.

Claim 1

Claim 1 has been amended by the current Reply to more clearly define the embodiment therein. As amended, Claim 1 defines:

A method for finding a region of high importance in a video, the video including a plurality of video frames having pixels, wherein the video is regarded as a three dimensional volume in a x-y-t space, the t-component of the x-y-t space representing a time axis, comprising:

- determining a kinetic energy for each pixel within the video;
- assigning pixel values to the pixels within the video based on the kinetic energy of each pixel;
- constructing groups from the pixels having pixel values; and
- merging pixel groups to generate regions of high importance, wherein each region of high importance comprises a predetermined three-dimensional shape, the predetermined three-dimensional shape having a three dimensional volume in the x-y-t space.

Averbuch relates to a method for automatic object extraction of moving objects in color video frames. The method disclosed therein appears to generally include the following steps:
(1) provide a plurality of video frames, (b) perform a reciprocal illumination correction of the

video frames to yield respective smoothed video frames, (c) perform a change detection operation between the smoothed video frames to obtain a difference image, and (d) perform a local adaptive thresholding operation of the difference image to generate a binary image containing extracted objects, the local thresholding operation using a weight test to determine a boundary of each of the extracted objects.

Claim 1, as amended, involves identifying regions of high importance having a three-dimensional shape. As set forth in the Office Action for previously presented Claim 10 (which has been cancelled and incorporated into Claim 1 in this Reply), Averbuch does not explicitly disclose merging pixels into a larger group in the shape of a predetermined three-dimensional shape. Accordingly, the present rejection under 35 U.S.C. § 102(e) cannot be sustained for Claim 1 as amended.

Previously presented Claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Averbuch in further view of Sekiguchi. It is respectfully submitted that Claim 1, as amended, is not obvious in view of Averbuch and Sekiguchi for, among other things, the following reasons.

As set forth in KSR Int. Co. v. Teleflex, 127, S. Ct. 1727 (2007),

[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.

Therefore, an Examiner may often find every element of a claimed invention in the prior art; however, if identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. See In re Rouffet, 149 F.3d 1350 (Fed. Cir. 1998). Rejecting patents solely by finding prior art corollaries for the claimed elements would permit an Examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach

would be “an illogical and inappropriate process by which to determine patentability.” See Sensonics, Inc. v. Aeresonic Corp., 81 F.3d 1566, 1570 (Fed. Cir. 1996). The KRS decision did nothing to abrogate these cases or the long-standing principle. In fact, the Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in view of KSR attempts to affirm this principle by quoting KSR as follows: “[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.”

Sekiguchi discloses a method in which a region extraction is conducted on multi-dimensional digital data characterized in that when a region other than an objective region is extracted as a result of the region extraction, a point belonging to the region is specified, thereby executing a deletion processing of the area other than the objective region. Sekiguchi provides for a multi-dimensional data processing apparatus in which a region extraction is conducted on three-dimensional voxel data by use of a concatenated region expansion processing so as to present a three-dimensional display of the extraction objective region. Both the method and apparatus disclosed therein appear to be intended to be applied to images attained by x-ray, CT and MRI apparatuses.

Claim 1 sets forth a method of merging groups of pixels into a larger group in the shape of a predetermined three-dimensional shape, the three-dimensional shape having a three dimensional volume in x-y-t space. It is respectfully submitted that the inventive concept of the three-dimensional shape described in Claims 1 differs from the three-dimensional shapes dealt with in Sekiguchi. In Sekiguchi, the three-dimensional data all originate from tangible objects having traditional x-y-z characteristics. In this invention, however, a two-dimensional video frame having x-y characteristics is used to create a three dimensional shape by adding in a t (or time) axis between additional two-dimensional video frames. This novel and inventive concept of using time as an axis to create virtual three-dimensional shapes where no such three-dimensional shapes previously existed to determine regions of high interest in a video is not disclosed in or obvious in light of Averbuch or Sekiguchi. Accordingly, it is respectfully submitted that aside from impermissible hindsight, a sufficient rationale to combine the relevant elements of Averbuch with the elements of Sekiguchi to render Claim 1 unpatentable does not exist.

In view of the comments provided above, Applicant respectfully submits that the embodiment of the invention defined in Claim 1 is neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

Claim 3

Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Averbuch in view of Divakaran. It is respectfully submitted that Claim 3 is allowable as depending from an allowable independent claim and further in view of the amendments and comments to Claim 1 provided above, which are hereby incorporated by reference. Furthermore, Claim 3, as amended, adds its own limitations which renders Claim 3 patentable in its own right.

According to the disclosure of Averbuch, "A different illumination between two consecutive frames can falsely lead to identification of the wrong object, and to prevent this false identification, we carry out reciprocal illumination correction 28. . . . In other words, we flatten or 'equalize' the illumination in each frame relative to the other, so that illumination is not a factor in the selection process that eventually determines the moving objects." See Averbuch, 19:22-19:33.

Claim 3, however, expressly relies on the use of pixel luminance values to ultimately find regions of interest. Accordingly, not only does Averbuch not disclose the method set forth in Claim 3, but it teaches away from using the method set forth in Claim 3. Since Averbuch teaches away from using luminance values to identify objects as set forth above, it would be inappropriate to combine the disclosures of Averbuch with the disclosures of Divakaran to reject a claim that relies on the use of pixel luminance values, such as Claim 3.

In view of the comments provided above, Applicant respectfully submits that the embodiment of the invention defined in Claim 3 is neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

Claim 5

Claim 5 sets forth that a pixel within a region of interest will be assigned a value of either 0 or 1, the pixel being assigned a value of 1 if it has a higher than average kinetic energy. Claim 5 was rejected as being anticipated by Averbuch at column 19, lines 9-15. That portion of Averbuch, however, does not appear to disclose assigning a value to a pixel using an average

kinetic energy. If anything, Averbuch indicates that the preferred method of computing local thresholds involves taking the 10 pixels having the highest intensity values among all the pixels in the frame and then using those 10 pixels as the “anchor” points that will be the foundation for deriving the final local connected components. See Averbuch, Col. 22:25-29. Accordingly, Averbuch, if anything, teaches away from assigning pixel values based on an average kinetic energy. Averbuch, therefore, does not anticipate Claim 5. Regardless, Claim 5 would not be anticipated by Averbuch since it depends on independent Claim 1 which is not anticipated by Averbuch as set forth above, the comments provided above for Claim 1 being incorporated by reference here.

In view of the comments provided above, Applicant respectfully submits that the embodiment of the invention defined in Claim 5 is neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

Claim 9

Claim 9, similar to Claim 5, uses average kinetic energy values to construct pixel groups. However, as set forth above for Claim 5, Averbuch teaches away from using average kinetic energy values to construct pixel groups. Specifically, in Averbuch, it is stated that it is preferred to use the 10 pixels having the highest intensity values to be the foundation for deriving the final local connected components. Averbuch, therefore, does not anticipate Claim 9. Regardless, Claim 9 would not be anticipated by Averbuch since it depends on independent Claim 1 which is not anticipated by Averbuch as set forth above, the comments provided above for Claim 1 being incorporated by reference here.

In view of the comments provided above, Applicant respectfully submits that the embodiment of the invention defined in Claim 9 is neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

Claims 12-13

Claims 12-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Averbuch in view of Sekiguchi and Simanovsky. In the Office Action, for Claim 12, it was stated that “[i]t would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Sekiguchi, and modify the region merging to include use of an energy

density threshold, as taught by Simanovsky, thus better identifying thin objects, as discussed by Simanovsky." It is unclear, however, why the ability to better identify thin objects (such as a knife in Simanovsky) is relevant to Claims 12-13. In Claims 12-13, a minimum energy density threshold and a minimum volume threshold can both be used to help determine whether certain pixel groups should be incorporated into a region of high importance so that the regions of high importance do not get diluted with unnecessary pixels. These claims have nothing to do with identifying thin objects. Accordingly, it is respectfully submitted that an insufficient rationale has been provided to combine the references set forth above to reject Claims 12-13.

In view of the comments provided above, Applicant respectfully submits that the embodiments of the invention defined in Claims 12-13 are neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

Claims 4, 6-8, 11

Claims 4, 6-8, 11 are not addressed separately but it is respectfully submitted that these claims are allowable as depending from an allowable independent claim and further in view of the amendments to Claim 1, and the comments provided above. Applicant respectfully submits that these Claims are similarly neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested. It is also submitted that these claims also add their own limitations which render them patentable in their own right. Applicant respectfully reserves the right to argue these limitations should it become necessary in the future.

Claims 14-19

Claims 14-19 are new added claims. It is respectfully submitted that these claims are similarly neither anticipated by, nor obvious in view of any of the cited references.

VI. Conclusion

In view of the above amendments and remarks, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowable, and reconsideration thereof is respectfully requested. The Examiner is respectfully requested to telephone the undersigned if he can assist in any way in expediting issuance of a patent.

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The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 06-1325 for any matter in connection with this reply, including any fee for extension of time, which may be required.

Respectfully submitted,

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